

STATE OF IDAHO
DEPARTMENT OF FISH AND GAME

Joseph C. Greenley, Director

Job Completion Report
for
February 2, 1977 – July 30, 1978

RED RIVER DEMONSTRATION POND

Pacific Northwest Regional Commission
Project No. 578

October, 1978

Red River Chinook Rearing Pond

1977

Red River Rearing Pond was first placed in operation during the summer of 1977. All fingerlings placed in the pond were received from Rapid River Hatchery near Riggins, Idaho.

On July 6, the first load of 165,000 fish was stocked into the pond. On July 7, and July 12, there were 165,000 and 171,600 chinook stocked which gave a total of 501,600 fingerlings stocked for rearing to sub-smolt size. The original stocking size had been estimated at 400,000; however, with additional fish available from Rapid River, it was determined we could rear some excess fish.

A pond tender was hired to monitor the pond for four hours every day. Her duties were to maintain flows and observe fish condition. She also filled feeders as needed and cleaned the outlet screen.

The Rapid River Salmon Hatchery Superintendent instructed the pond tender and me on determining feed ratios during the three months the fish were to be held. At the same time, Don Carr, Construction Foreman, oriented us on electrical equipment use associated with the automatic feeders and feed storage facility.

Operations went smoothly for the first several weeks with the exception of an outbreak of "sunburn" which appeared after the first week. No ill effects were observed from the sunburn and the symptoms disappeared in about ten days.

We were unfortunate enough to place the rearing pond in operation during the lowest flow year on record. The minimal flows with their higher temperatures undoubtedly had a major effect on the following sequences.

August 18, the tender phoned and stated there had been an alarming increase in the number of dead fish at the pond, and the gills of the dead fish seemed to have "rotted". Arrangements were made with the disease specialist from Dworshak National Fish Hatchery, Rick Nelson, to meet me at the rearing pond the next morning. Mr. Nelson took samples at the pond which he analyzed immediately. Ichthyophthirius multifiliis, ("Ich") was found on the gills and heavily in the mucus. Other parasites noted were costia, gyrodactylus, epistylus, and scyphidia. A bacteria culture aeromonas hydrophilia, was isolated at the lab and it was diagnosed that this bacterial infection caused the mortalities and should be treated first. A copy of the hatchery report is attached.

While waiting for the examination report from Dworshak Hatchery, fish mortalities continued to increase. On August 23, a member of the Rapid River Hatchery staff and a graduate student from the University of Idaho analyzed mortalities at the pond and determined the major cause of death was "Ich".

The Idaho Department of Fish and Game fish pathologist visited the pond on August 24. His analysis confirmed nearly the same parasites present as found by Dworshak Hatchery personnel. His report is attached.

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Treatment of the diseased fish was determined not desirable due to the chemicals needed and their possible interaction with livestock immediately downstream from the pond. Low flows and the high concentrations needed to effect a cure may have produced a health hazard.

It was directed by the Department headquarters staff that the fish should be immediately released into Red River. On August 30, I attempted to drain the pond. This was one month earlier than anticipated. Complete drainage of the pond could not be facilitated due to the outlet structure being higher than a majority of the pond bottom. Most of the low area was 6-8 inches deep, with some areas being more than a foot. A large percentage of the fish did migrate from the pond as it emptied; however, an estimated 30,000 fish still remained in the low areas. An attempt was made to seine the remaining fish, but the uneven bottom and muddying of the water made it impossible to capture a significant amount. To keep the fish alive and to hopefully flush out more sub-smolts, flows were again placed through the pond.

The stress of lowering the flows and chasing about the pond was apparently too great on a portion of the remaining diseased fish as most were dead the next morning. It did appear some additional fish had left the pond. Flows are being maintained throughout the pond until freezing weather in hopes more fish will leave. By the middle of November the flows were shut off for the winter.

Determining the number of mortalities has been very difficult. By taking the actual count from the channel tender's records, then estimating the mortalities present on the bottom of the pond along with the amount that died during release operations, I have calculated a minimum of 150,000 fish died before, or during release. Undoubtedly, additional mortalities could be expected after release. Substantial numbers of fish did survive, however, since during the annual spawning ground surveys, tens of thousands of sub-smolts could be observed in the river for the five miles the survey extended below the rearing pond.

During the first year of operation at a new facility we should anticipate finding any problems and getting them cured. There definitely were problems at the Red River Pond; some we can remedy easily, and others with more difficulty. One problem is the inability to drain the pond. To rectify this situation, the Engineering Bureau will lower the outlet prior to use next summer. An additional problem was placing too many fish in the pond prior to fully realizing the optimum capacity. We will introduce fewer fish into the pond for rearing in 1978. Another problem is the ability of resident fishes to enter the pond through the inlet structure. Nine whitefish in the 11-12 inch range were taken from the pond along with numerous dace and several small squaw fish. Screening of the inlet will eliminate this problem. The major problem, and one which has not satisfactorily been solved as of yet, is how to treat a disease outbreak such as occurred this year. Contingency plans need to be formulated for specific occurrences so immediate action may be taken. These plans will be ready by July, 1978.

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Before introducing fish into the pond next year, the entire area will be disinfected. All other modifications will be completed and hopefully the problems encountered this year will have been alleviated and we can have a successful season. A copy of the channel tender's daily records are attached.

Submitted by:

Steven A. Hoss
Regional Fishery Biologist
Region 2



STATE OF IDAHO

DEPARTMENT OF FISH AND GAME

600 SO. WALNUT ST. - P. O. BOX 25
BOISE, IDAHO 83707

INTER-DEPARTMENT MEMO

Date October 3, 1977

From Harold Ramsey

To W. Bethke, D. Ortmann

Subject Fish Losses at Red River

On August 24, 1977 I went to Red River rearing pond to determine causes of losses in chinook fingerlings. Actual numbers of dead fish were hard to determine due to turbidity of water, pond design, and unknown numbers lost over the screen. Steve Hoss would have a more accurate estimate of total losses. Dworshak personnel had also examined the fish and Steve would have their report.

Necropsy of chinook showed several kinds and many numbers of external parasites present on the fish. Primarily these were all Protozoans, namely Ichthyophthirius multifiliis, Costia sp., Scyphidia, Trichodina. There were also some bacteria present on the gills, but this is not uncommon. No fish examined showed any evidence of internal bacterial infections. Due to sheer numbers and locations, I suspect "Ich" to be the primary cause of losses. Whitefish within the pond were also infected with "Ich".

Some treatments were used to effect a cure, but seemed to have little effect on the parasites, probably due to low concentrations used. At full strength three chemicals were effective against the parasites, but due to human and livestock usage of water supplies and low dilution factor further chemical treatments were decidedly not in the Department's best interests.

Faced with these circumstances it was recommended that the fish be released three to four weeks earlier than anticipated in hopes of survival of lightly infected fish or those which had not yet become infected.

A complete disinfection of the pond and equipment should be done before any fish are re-introduced using 200-600ppm HTH chlorine. Certain precautions should be taken to prevent leakage of chlorinated water into the river until chlorine is either dissipated or neutralized.

Future recommendations would include earlier detection of infectious agents and hopefully early clearance of chemicals by FDA for hatchery use. Also a good water chemistry work-up is needed on supply waters. Better screening devices at the inflow to the pond is needed to exclude entry of wild or planted fish. Also clearance of all dead and live trees in the vicinity of the power lines is needed to prevent power outages to the freezing unit and electrocution of fish.

Sincerely,

Harold Ramsey

Memo to Files

Fish Health Examinations

Idaho Fish and Game

Red River Holding Pond

8-19-77

Species:

SCS Fingerlings 500,000

Water Temp.

61°F

Fish showed the following:

Gills: Moderate swelling of gill tips, slight mucus buildup with high loads of debris noted. Several fish had severe necrosis of gill tissue.

Parasites found. "Ich", both adults and tomites, none were encysted yet. Light loads of epistylus on the gills.

Bacteria found. Culture isolated aeromonas - hydrophilia.

Mucus: Unusually thick and white in consistency. Moderate to heavy loads of debris were noted.

Parasites noted. "Ich" (heavy), costia (light), gyrodactylus (light, epistylus (light to moderate), scyphidia (moderate).

External: ok. No fin erosion noted.

Internal: Ok. Several fish showed pale livers. Most fish had very good fat content.

Recommendations: An oxygen profile should be done to compare with temperatures and number of fish.

The bacterial infection should be treated first in so much as the mortalities were caused by an aeromonas hydrophilia. Possible treatments are Roccal, TM-50, malachite green, formalin, etc.

The parasitic infection of Ichthyophthirius multifiliis was fast becoming a major problem at the time of examination. "Ich" was the cause of the flashing in the pond but was not the cause of death. Possible treatments are cutrine, formalin, malachite green, etc.

The stream above the holding pond should have a weir across it and be void of fish as this is a source of infection.

Conclusion: Several things stand out as possible problems. One, that the carrying capacity of the pond may have been exceeded. Two, the water source above the holding pond has trout in it and is a constant reservoir of infection.

Red River

Both infections will have to be treated to avoid a total loss. High losses can be expected as the infections were in major concentrations.

Chemical treatments would seem to be a problem in as the outflow empties into a pasture containing livestock.

If the laboratory can be of further help, please contact Joe Lientz, Hatchery Biologist - Area.

Examinations by Rick Nelson
Assistant Hatchery Biologist - Area
Dworshak NFH

RED RIVER REARING POND - 1977

Date	Average H ₂ O Temp.	LB of Feed per day	Comments
July 13	59 ⁰	218	Morning - 2 Kingfisher. Power off from 7 PM last night to 4:30 AM this morning. 7 dead fish on outlet screen 25 dead fish on screen
July 14	58 ⁰	228	Morning - 1 Kingfisher. 6 dead fish on screen
July 15	58 ⁰	218	7 dead fish on screen
July 16	58 ⁰	218	1 Kingfisher. Water level staying about same. 1 dead fish on screen - morning 2 dead fish on screen - night
July 17	59 ⁰	218	1 Kingfisher. 2 dead fish - morning - screen
July 18	57 ⁰	228	White webb or fungus on 1 in every 1000 fish. Fish & Game from Riggins came in - took look at fish-took out few to run test on. Cleaned drum inside feeder-first time. 3 dead fish on screen this morning
July 19	58 ⁰	208	Duck family (mama & 7 babies) still on pond, but no kingfisher! No dead fish on outlet screen this morn.
July 20	59 ⁰	218	1 Kingfisher. Fish look good. 3 dead fish on outlet screen.
July 21	60 ⁰	228	Cooler temp. (12 ⁰ when I came-down to 10 ⁰ when I left). Quite a bit of green algae on edge of pond and bottom. No more than before fish with white on them. They all look good. The one's with the white look like they are swimming good and eating. 6 dead fish on outlet screen, pretty soft maybe something up off the bottom of the pond. 3 dead fish floating on edge of pond.

Red River Rearing Pond - 1977

Date	Average H ₂ O Temp.	LB of Feed per day	Comments
July 22	58 ⁰	238	1 Kingfisher and 1 Greater yellowlegs sandpiper (this is what it looked like to me). Cooler at 10 ⁰ above when I came this morning. Seems there are less fish with the white on them than before. 8 dead fish on outlet screen
July 23	60 ⁰	218	6 dead fish on outlet screen
July 24	60 ⁰	238	1 Kingfisher still here. Cooler staying at about 10 ⁰ above. 6 dead fish on outlet screen
July 25	59 ⁰	238	Pond water pretty dirty from heavy rain all day Sunday. 1 dead fish on outlet screen
July 26	59 ⁰	228	Pair of blue heron and 3 Kingfishers. 5 dead fish on outlet screen
July 27	60 ⁰	228	2 Kingfishers. Water level on pond staying about the same. 2 dead fish on outlet screen
July 28	59 ⁰	238	2 Kingfishers. 1 dead fish on outlet screen
July 29	60 ⁰	228	2 Kingfishers, pair blue heron and duck family (8). 2 dead fish on outlet screen
July 30	60 ⁰	238	2 Kingfishers. Put 1 pint oil in drive chain case on drum at outlet. 2 dead fish on outlet screen
July 31	60 ⁰	238	1 blue heron, 2 King fishers. Water level same - inlet water looks good. Cleaned cones. No dead fish on outlet screen

Red River Rearing Pond - 1977

Date	Average H ₂ O Temp.	LB of Feed per day	Comments
August 1	59 ⁰ 57 ⁰ morn 62 ⁰ night	238	3 blue heron. No dead fish on outlet screen
August 2	60 ⁰ 58 ⁰ morn 62 ⁰ night	228	2 Kingfishers. Cooler defrosting o.k. Temp. 0 ⁰ -no frost buildup in back of fan unit. 2 dead fish on outlet screen
August 3	60 ⁰ 58 ⁰ morn 62 ⁰ night	238	3 Kingfishers. 2 dead fish on outlet screen
August 4	61 ⁰ 58 ⁰ morn 63 ⁰ night	238	3 Kingfishers. Cooler Temp. at 0 ⁰ . 1 dead fish on outlet screen
August 5	62 ⁰ 60 ⁰ morn 64 ⁰ night	248	3 Kingfishers. 1 dead fish on outlet screen
August 6	60 ⁰ 58 ⁰ morn 62 ⁰ night	258	2 Kingfishers. 1 dead fish on outlet screen
August 7	60 ⁰ 56 ⁰ morn 63 ⁰ night	238	6 Kingfishers! 4 dead fish on outlet screen
August 8	60 ⁰ 58 ⁰ morn 61 ⁰ night	238	3 Kingfishers and 1 duck. 1 dead fish on outlet screen
August 9	60 ⁰ 58 ⁰ morn 62 ⁰ night	238	3 Kingfishers. 6 dead fish on outlet screen
August 10	60 ⁰ 57 ⁰ morn 62 ⁰ night	238	2 Kingfishers. Pint of oil in chain case. No dead fish on outlet screen
August 11	61 ⁰ 58 ⁰ morn 64 ⁰ night	238	3 Kingfishers. 4 dead fish on outlet screen

Red River Rearing Pond - 1977

Date	Average H ₂ O Temp.	LB of Feed per day	Comments
August 12	61 ⁰ 58 ⁰ morn 64 ⁰ night	463	2 Kingfishers & 1 Greater yellowlegs sandpiper. Changed sec. timer on feeders to 40 sec. (from 20 sec.). Fed 231 pds feed this morning-will put in 232 pds this afternoon at 12:30 5 dead fish on outlet screen
August 13	62 ⁰ 58 ⁰ morn 66 ⁰ night	463	Changed sec. timer to 35 sec. Fed 230 lbs of feed morning and 220 in afternoon at 12:30. 3 dead fish on outlet in morning
August 14	60 ⁰ 59 ⁰ morn 61 ⁰ night	481	250 lbs feed in morn. -231 lbs feed in afternoon at 1:00. 6 Kingfishers in the morn and the duck family here in the afternoon. 6 dead fish on outlet screen
August 15	60 ⁰ 58 ⁰ morn 62 ⁰ night	444	Fed 222 lbs morn & 222 at 2:00. 5 Kingfishers; 2 ducks; 1 greater yellowlegs sandpiper. Changed sec. timer to 30 sec. They were feeding out too soon. 6 dead fish on outlet screen
August 16	61 ⁰ 58 ⁰ morn 64 ⁰ night	444	Pond level down. 4 ducks; 3 kingfishers; 2 sandpipers, greater yellowlegs. 14 dead fish on outlet screen
August 17	62 ⁰ 59 ⁰ morn 64 ⁰ night	463	9 ducks; 2 kingfishers; 1 blue heron; 2 greater yellowlegs sandpipers. More feed delivered today. 27 dead fish on outlet screen
August 18	62 ⁰ 60 ⁰ morn 64 ⁰ night	481	9 big ducks-2 babies; 4 Kingfishers. Power went off at 5:30 PM-off all night. 9:30 AM called Steve about dead fish-found rot on gills of most all dead fish. 108 dead fish on edge of pond) -7:00 AM 57 dead fish on outlet screen) 8 dead on screen) - 1:00 PM 22 dead on edge of pond)

Red River Rearing Pond - 1977

Date	Average H ₂ O Temp.	LB of Feed per day	Comments
August 19	62 ⁰ 60 ⁰ morn 64 ⁰ night	481	1 blue heron; 4 kingfishers; 4 ducks. Power still off this morning. Will hand feed every 1-1/2 hours. Cooler temp. at 14 ⁰ above with power being off for 14 hours. Cooler stayed pretty cool 30 ⁰ above now at 8:30 PM. Fed 240 this morning; 241 in afternoon. Live fish in pond swim o.k. and eating. Steve Hoss and fish biologist came up from Dworshak Fish Hatchery. Fish have "Ich" & some type of bacteria. 142 dead on outlet screen 227 on edge of pond
August 20	62 ⁰ 60 ⁰ 7AM 68 ⁰ 2PM 64 ⁰ 8PM	481	10 big ducks; 1 blue heron; 3 kingfishers; 3 greater yellowlegs sandpipers. Power off all night-came on for 2 hrs then off again till 10 AM on again. I fed just in the afternoon 241 lbs because power was off in the morning, & Don Carr wanted to keep cooler door closed. 175 dead fish on outlet screen 284 on edge of pond
August 21	61 ⁰ 60 ⁰ 7:30 AM 63 ⁰ 2:00 PM 62 ⁰ 8:00 PM	481	2 kingfishers; 10 ducks; 1 sandpiper, greater yellowlegs. Overcast sky to very windy. 340 dead fish on outlet screen 460 around edge of pond.
August 22	60 ⁰ 58 ⁰ 7:30 AM 63 ⁰ 2:30 PM 61 ⁰ night	463	5 ducks; 2 kingfishers. Cloudy and raining hard this morning. 634 dead fish on outlet screen 402 on edge of pond

Red River Rearing Pond - 1977

Date	Average H ₂ O Temp.	LB of Feed per day	Comments
August 23	59 ⁰ 56 ⁰ Morn 63 ⁰ 2 PM 61 ⁰ night	444	16 ducks; 3 kingfishers. Gave 50 ML Cutrine-plus to pond through inlet pipe. Fed only 222 lbs feed in the morning. 216 dead fish off screen 640 dead fish on outlet screen 280 on edge of pond
August 24	58 ⁰ 58 ⁰ morn 58 ⁰ night	No feed today (75 ML Cutrine in pond)	26 ducks on pond; 3 kingfishers. Larry Wimer & Harold Ramsay here to look at fish. 2671 dead fish today (434 on edge of pond; 1589 screen; 261 screen; 210 in pond; 177 on screen)
August 25	56 ⁰ 54 ⁰ 7:30 AM 57 ⁰ 7:20 PM	No feed today	16 ducks; 2 kingfishers. Cloudy & raining. 200 ML Cutrine in pond. 2596 dead fish today (823 on outlet screen; 360 on edge of pond; 213 on screen, 12:00; 225 around edge of pond, 12:20; 660 outlet screen, 8PM; 315 along edge of pond)
August 26	53 ⁰ 54 ⁰ 7AM 52 ⁰ 7:30PM	Fed half the amount today, 185 lbs	2 Kingfishers. Cloudy to raining 7PM. 2667 dead fish today (744 on outlet screen, 7AM; 1101 around pond; 144 outlet screen 1PM; 278 around pond; 400 screen)
August 27	53 ⁰ 52 ⁰ 7AM 53 ⁰ 7PM	158	3 Kingfisher; 8 ducks - 7 AM. Cloudy to raining. 2438 dead fish today (838 around edge of pond; 800 on outlet screen; 800 on outlet screen)

Red River Rearing Pond - 1977

Date	Average H ₂ O Temp.	LB of Feed per day	Comments
August 28	52 ⁰ 50 ⁰ 7AM 53 ⁰ 7PM	158	7AM 6 Kingfishers; 11 big ducks; 2 small ducks. Sky overcast but not raining this morning. Pond pretty dirty from all the rain. Fish in pond taking feed much better than 3 days ago. Rained afternoon. 2960 dead fish today (1200 around edge of pond; 1050 on outlet screen; 710 on outlet screen)
August 29	52 ⁰ 50 ⁰ morn 54 ⁰ night	148	7AM 5 Kingfishers; 10 ducks. Rained hard again during night. Sky overcast. 3200 dead fish today (550 around edge of pond; 1000 on outlet screen. 3 PM- 700 on outlet screen. 7 PM- 350 around edge, 600 on screen)
August 30	51 ⁰ morn	148	5 Kingfishers; 8 ducks. Sky overcast, raining hard off and on. 800 dead fish on outlet screen 1000 on pond.